**Listing of Claims**

1. A fuel additive composition intended to be used at a dose level of from about 20 to about 500ppm by weight in a liquid hydrocarbon fuel combusted in internal combustion machines, said composition comprising, in admixture form:

(a) from about 10 to about 57.2% by weight of water;

(b) from about 28.9 to about 80% by weight of a surfactant selected from the group consisting of:

(i) non-ionic

(ii) anionic

(iii) cationic

(iv) amphoteric and

(v) combinations of one or more of said (i) through (iv) surfactants;

(c) from about 0 to about 27.5% by weight of a co-surfactant selected from the group consisting of:

(i) low molecular weight alcohols

(ii) low molecular weight glycols

(iii) glycol ethers and

(iv) combinations of one or more of said (i) through (iii) co-surfactants;

(d) from about 0 to about 30% by weight of a hydrocarbon solvent.

2. The fuel additive composition of claim 1 wherein the liquid hydrocarbon fuel is selected from the group consisting of gasoline, diesel fuel and jet fuel.

3. The fuel additive composition of claim 1 wherein the water comprises from about 16.7 to about 33.8% by weight of said composition.

4. The fuel additive composition of claim 1 wherein the surfactant comprises from about 49.9 to about 72.5% by weight of said composition.

5. Cancelled.

6. The fuel additive composition of claim 1 wherein the co-surfactant comprises from about 13.9 to about 21.9% by weight of said composition.

7. (amended) The fuel additive composition of claim 1 wherein the co-surfactant is selected from the group consisting of: methanol, ethanol, propanol, butanol, ethylene glycol, propylene glycol, ethylene glycol n-butyl ether and dipropylene glycol methyl ether and combinations thereof.

8. The fuel additive composition of claim 1 wherein the hydrocarbon solvent is kerosene.

9. The fuel additive composition of claim 1 wherein the hydrocarbon solvent is absent.

10. A micro-emulsion fuel composition intended to be combusted in internal combustion machines, said composition comprising:

(a) from about 999,500 to about 999,980ppm by weight of a liquid hydrocarbon fuel;

(b) from about 11 to about 400ppm by weight of a surfactant selected from the group consisting of:

(i) non-ionic

(ii) anionic

(iii) cationic

(iv) amphoteric and

(v) combinations of one or more of said (i) through (iv) surfactants;

(c) from about 0 to about 100ppm by weight of a co-surfactant selected from the group consisting of:

(i) low molecular weight alcohols

(ii) low molecular weight glycols

(iii) glycol ethers and

(iv) combinations of one or more of said (i) through (iii) co-surfactants;

(d) from about 0 to about 150ppm by weight of a hydrocarbon solvent;

(e) from about 5 to about 95ppm by weight of added water, such that the weight ratio of said surfactant to said added water falls within the range of from about 8:1 to about 0.5:1.

11. The fuel composition of claim 10 wherein the liquid hydrocarbon fuel comprises from about 999,750 to about 999,917ppm by weight of said composition.

12. The fuel composition of claim 10 wherein the liquid hydrocarbon fuel is selected from the group consisting of gasoline, diesel fuel and jet fuel.

13. The fuel composition of claim 10 wherein the surfactant comprises from about 48 to about 130ppm by weight of said composition.

14. Cancelled.

15. Cancelled.

16. (amended) The fuel composition of claim 10 wherein the co-surfactant is selected from the group consisting of: methanol, ethanol, propanol, butanol, ethylene glycol, propylene glycol, ethylene glycol n-butyl ether and dipropylene glycol methyl ether and combinations thereof.

17. The fuel composition of claim 10 wherein the hydrocarbon solvent is kerosene.

18. The fuel composition of claim 10 wherein the hydrocarbon solvent is absent.

19. The fuel composition of claim 10 wherein the added water comprises from about 20 to about 85ppm by weight of said composition.

20. The fuel composition of claim 10 wherein the weight ratio of said surfactant to said added water falls within the range of from about 3:1 to about 1.5:1.

21. (new) A fuel additive composition intended to be used at a dose level of from about 20 to about 500ppm by weight in a liquid hydrocarbon fuel combusted in internal combustion machines, said composition comprising, in admixture form:

(a) from about 10 to about 57.2% by weight of water;

(b) from about 28.9 to about 80% by weight of a surfactant wherein the surfactant is a combination of amine alkylbenzene sulphonate, POE (20) sorbitan monooleate, tall oil fatty acids, oleyl imidazoline hydrochloride and oleamide diethanolamine;

(c) from about 0 to about 27.5% by weight of a co-surfactant selected from the group consisting of:

(i) low molecular weight alcohols

(ii) low molecular weight glycols

(iii) glycol ethers and

(iv) combinations of one or more of said (i) through (iii) co-surfactants;

(d) from about 0 to about 30% by weight of a hydrocarbon solvent.

22. (new) A micro-emulsion fuel composition intended to be combusted in internal combustion machines, said composition comprising:

(a) from about 999,500 to about 999,980ppm by weight of a liquid hydrocarbon fuel;

(b) from about 11 to about 400ppm by weight of a surfactant wherein the surfactant is a combination of amine alkylbenzene sulphonate, POE (20) sorbitan monooleate, tall oil fatty acids, oleyl imidazoline hydrochloride and oleamide diethanolamine

(c) from about 0 to about 100ppm by weight of a co-surfactant selected from the group consisting of:

(i) low molecular weight alcohols

(ii) low molecular weight glycols

(iii) glycol ethers and

(iv) combinations of one or more of said (i) through (iii) co-surfactants;

(d) from about 0 to about 150ppm by weight of a hydrocarbon solvent;

(e) from about 5 to about 95ppm by weight of added water, such that the weight ratio of said surfactant to said added water falls within the range of from about 8:1 to about 0.5:1.

23. (new) A micro-emulsion fuel composition intended to be combusted in internal combustion machines, said composition comprising:

(a) from about 999,500 to about 999,980ppm by weight of a liquid hydrocarbon fuel;

(b) from about 11 to about 400ppm by weight of a surfactant selected from the group consisting of:

(i) non-ionic

(ii) anionic

(iii) cationic

(iv) amphoteric and

(v) combinations of one or more of said (i) through (iv) surfactants;

(c) from about 21 to about 42ppm by weight of a co-surfactant selected from the group consisting of:

(i) low molecular weight alcohols

(ii) low molecular weight glycols

(iii) glycol ethers and

(iv) combinations of one or more of said (i) through (iii) co-surfactants;

(d) from about 0 to about 150ppm by weight of a hydrocarbon solvent;

(e) from about 5 to about 95ppm by weight of added water, such that the weight ratio of said surfactant to said added water falls within the range of from about 8:1 to about 0.5:1.

**REMARKS**

Claims 21, 22 and 23 are new and added for the first time and correspond to claims 5, 14 and 15 when put in independent claim format. Claims 5, 14 and 15 were not rejected and were objected to presumably for depending from a rejected claim.

Claims 7 and 16 are rejected under 35 U.S.C. 112, second paragraph. The Examiner suggested a word change to obviate the rejection. The suggested changes in Claims 7 and 16 are made.

Claims 1-4, 6, 7, 9-13, 16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grangette (US 4,396,400). Grangette is distinguishable from the

present invention. Grangette is directed at the impact of the additives on emissions and optimizing for that purpose. The Applicants are teaching using additives to improve fuel economy. While not mutually exclusive they are not the same purpose and the emphasis can and does in this instance lead in opposite directions. For Grangette the minimum and not preferable water content as a component is 100 ppm (column 4, line 5 to 6) & (column 6, lines 10 to 12). Grangette teaches increasing water content to 1000ppm to improve emissions and with content being as much as 5000ppm . For the Applicants the maximum and not preferable water content as a component is 95 ppm and the preferred content is significantly less.

It is unobvious to look to Grangette for a teaching of how an additive effects fuel economy.

Grangette did optimize the proportions of surfactant, water and co-surfactant and concluded that 1000 ppm of water was optimum (column 6, lines 10-12). However, Grangette was focused on emission reductions only; the potential for fuel economy benefits was not recognized and not investigated.

Grangette teaches the quantity of surfactant utilized is proportional to the quantity of water to be solubilized (column 3, lines 53 to 54). However, it is the Applicants' position that the surfactant to water ratios employed by Grangette are about the minimum necessary to produce a relatively stable micro-emulsion fuel having water droplets less than 0.4 microns (400 nanometers) diameter (column 3, lines 65-67). Grangette failed to realize that continuing to add more surfactant (increasing the surfactant to water ratio) would have reduced the water droplet sizes until they reached the nano size range necessary to improve vehicle fuel economy (page 5, lines 11-12). Applicants discovered

the critical importance of the water droplet size range (page 5, lines 11-12) and applied this discovery to achieve "unexpected" fuel economy benefits (page 14, table 11).

Grangette does not actually state the ratio range of surfactant to water; this ratio can be calculated from examination of the various examples. This calculation reveals a ratio range of surfactant to water from 0.6:1 to 0.25:1. Applicants do state a ratio range for the surfactant to water: the range is 8:1 to 0.5:1 (page 13, Table 10). The unexpected advantage of having such a high surfactant to water ratio clearly demonstrates one of the major differences between the instant application and that of Grangette.

Further consideration of the instant application test data examples #1 to #20 are submitted to demonstrate "*unexpected results*". In these examples, most vehicles treated with extra water (about 50 ppm) achieved "*unexpected*" fuel economy improvements as well as expected emission reductions (page 14, table 11). This demonstrates that below 100 ppm additional water, vehicle fuel economy benefits and emission reductions can both improve as the water content reduces still further, provided the water to surfactant ratio is within the suitable range (page 13, Table 10).

As the water content is reduced, not only do the benefits increase but the treatment costs are reduced proportionally. There is a threshold in the cost/benefit ratio which has never before been recognized and cannot be crossed except by fuels of the instant application (page 4, lines 26-27 to page 5, lines 1-3). Although Grangette admits to economic importance (column 2, lines 8-9), the Grangette patent does not recognize or teach how this can be achieved.

It is the unusually high surfactant to water ratio and the ultra low water content in the fuel which is the essence of the present invention (page 4, lines 5 to 10; page 4, lines

21-24; page 8, lines 9-13). Together with the unexpected result of significantly improved vehicle fuel economy, this clearly differentiates the instant application from Grangette.

On this basis it would have been unobvious to have looked to Grangette in addressing the objects this invention and if Grangette had been looked to then one would have moved away rather than toward the invention.

Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grangette as applied to claims above, and further in view of Yount (US 4,162,143). Yount fails to render Grangette more obvious and as such these claims should be allowed because the rejection based on Grangette should be withdrawn. Grangette also fails to teach the need for the addition of a solvent. Grangette teaches his invention is complete and implies the blending in of surfactants would be unnecessary and an unneeded economic disincentive.

There is additional basis for unobviousness which should be given some weight. The invention is not one of simply saving hydrocarbons by substituting other components such as ethanol but of achieving real fuel economy in which less fuel is used and the cost of the additives is not an economic disincentive. This can only be achieved with a low treatment level. Up until now, those skilled in the art have not taught a cost effective emulsion fuel additive. Applicants' additives can be sold at a typical retail level treatment cost of only about 7.2 cents per gallon of fuel treated (assignee's price lists are available on request). If fuel costs are $2.50 per gallon, saving 10% (refer to instant application test #14) would mean saving 25.0 cents per gallon. Comparing the cost of treatment (7.2 cents per gallon) with the fuel savings (25.0 cents per gallon) clearly demonstrates cost effectiveness.

The instant application also solves an unrecognized problem associated with low water content fuel emulsions. Without extra surfactants, any low water content fuel emulsion (typically 50ppm added water) would slowly be overwhelmed by the background level of dissolved water always present in all commercially available fuels (typically 50 to 100ppm). By employing unusually high surfactant to water ratios of typically 3:1 to 1:1 (page 10, line 7), applicants achieve the long term emulsion fuel stability and fuel savings essential to commercial success.

Fuel additives in accordance with the instant application are already being sold by the applicants' assignee (H2OIL Corporation) in several countries to individuals with various driving habits for use in both gasoline and diesel fuel. There are few complaints and none indicating that the mixtures become unstable. See www.h2oil.com

Applicants' fuel additives have already achieved a significant level of commercial success. Assignees' additives are currently the #1 selling retail fuel additives in Japan (sold by Kure under the trade names "Power Booster" and "Super Power Booster"). Assignee has also achieved substantial sales in China, Thailand, Taiwan, Holland, Korea, Singapore and Malaysia. During the last three years, assignee's overseas sales for fuel additives have been well over $3 million (verification available on request).

The instant application is in a crowded art (fuel emulsions). It is well recognized that in a crowded art, even a small step forward is worthy of patent protection. While the instant application is far more than a small step forward, nevertheless this factor mitigates in the applicants' favor.

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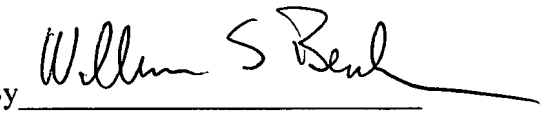
Applicants respectfully request that the claims be passed to allowance.

Respectfully submitted,

By 

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